

VIKII **PUBLIC HEALTH LAW** CONFERENCE

Building and Supporting Healthy Communities for All September 21-23





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Scenarios, Public Health Planning & Governance in the era of the Climate Crisis

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Objectives

- Describe governance and planning challenges of the climate crisis
- Define scenarios
- Introduce strategic foresight model for planning







Source: Adapted from Defining disaster resilience: a DFID approach paper (8).



- Inability to rely on historic data and trend analysis for planning.
- Increased frequency of "unprecedented" events
- Systems failures and inequities intensify risk.
- Intense complexity
- Threshold problems
- Need to think on longer time scales

How can we plan?



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Traditional Planning

Assumes the future - it's a trend, we have to adapt to it

Cannot accommodate stress / unplanned events

Implementation is a problem - High staff involvement

Works well in highly-stable environments

Emissions

Concentrations

Scenarios

"A scenario is a description of how the future may develop based on a coherent and internally consistent set of assumptions about key drivers including demography, economic processes, technological innovation, governance, lifestyles and relationships among these driving forces"

- IPCC, 2021: Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [Masson-Delmotte, V., P. Zhai, A. Pirani, S.L. Connors, C. Péan, S. Berger, N. Caud, Y. Chen, L. Goldfarb, M.I. Gomis, M. Huang, K. Leitzell, E. Lonnoy, J.B.R. Matthews, T.K. Maycock, T. Waterfield, O. Yelekçi, R. Yu, and B. Zhou (eds.)]. Cambridge University Press. In Press.

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Translation

Relationship to Public Health

- What are the health effects of climate change?
- What are the health effects of attempts to adapt to climate change?
- What are the health effects of mitigating emissions?
- How does human health fit?

World Health Organization. *Operational Framework for Building Climate Resilient Health Systems*. World Health Organization, 2016. https://books.google.com/books?id=CAYVjwEACAAJ.

STRATEGIC FORESIGHT MODEL / STRATEGY

Strategic Foresight Model

WE CAN BE ACTIVE IN CREATING THE FUTURE AND PREPARING FOR LIKELY FUTURES

Based on the Framework Foresight Model University of Houston

Based on the Framework Foresight Model University of Houston

Possible future scenarios are chosen not because they will happen but because they *might* happen. Planning for them is the point, they are not the point.

TRADITIONAL STRATEGIC PLANNING

SCENARIO APPROACH

Something might go wrong or be different!

- Know how to scramble
- Know how to ford
- Prepared for LIKELY scenarios
 - Bears
 - Water issues
 - First Aid
 - **Rescue**
 - Cooking

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Challenges

- Scenario planning is challenging and requires commitment
- Legal and governance structures are not in place to support the demands of the climate crisis.
 - Scenarios and foresight can help imagine new approaches to public health governance.
- For many, challenge of accepting new realities / ways of living

Please remember to fill out the conference survey location in the description of this session

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Adaptation of Surveillance Systems for Vector-Borne Diseases Accompanying Climate Change

Climate Change and Vector-Borne Disease Modeling

Will climate change affect VBD risk?

Focus has been on human-vector-human transmitted diseases (e.g., malaria and dengue)

Results of simplified modeling (e.g., Patz et al., 1998; Martens et al., 1999)

Climate change could greatly increase numbers of human cases (increase geographic range and altitude)

Results of statistical pattern matching (e.g., Rogers and Randolph, 2000)

Climate change could have a small effect on numbers of human cases (small changes to geographic range/altitude)

Example of Weather Effects: El Niño

Global warming intensify El Niño

Several studies found relationships between dengue epidemics and ENSO (El Niño Southern Oscillation)

Drought conditions: increase water storage around houses \rightarrow elevated *Aedes aegypti* populations

Enhanced breeding opportunities when rainfall accumulates following drought (Kuno et al., 1995)

ENSO= global scale pattern of climate variation accounting for up to 40% of temperature and rainfall variation in Pacific

Hales et al., 1999

Vector Activity

Increased relative humidity increases activity, heavy rainfall decreases activity

Increased activity increases transmission rates

National Geographic

Ranger DJ

Ogden et al., 2005; Vail and Smith, 1998

Vector and Host Seasonality

Vector-borne zoonoses mostly maintained by wildlife

Humans are irrelevant to their ecology

Vectors and their hosts are subject to seasonal variations that are climate related (e.g., temperature) and climate independent (e.g., day-length)

Seasonal variations affect abundance and demographic processes of both vectors and hosts

Evidence of Climate Change Effects

Some specific disease examples:

Malaria – East African highlands

- Lyme disease Canada
- Schistosomiasis China
- Bluetongue Europe

Summary of Climate Change Effects

Climate change has the potential to

Increase range or abundance of animal reservoirs and/or arthropod vectors

Lyme

Prolong transmission cycle

West Nile virus, and other arboviruses

Increase importation of vectors or animal reservoirs

Dengue, West Nile virus

Increase animal disease risk and potential human risk

Emerging\Re-emerging Infectious Diseases

Introduction of exotic parasites into existing suitable host/vector/humancontact ecosystem (West Nile)

Geographic spread from neighboring endemic areas (Lyme)

Ecological change causing endemic disease of wildlife to "spill-over" into humans/domesticated animals (Lyme)

True "emergence": evolution and fixation of new, pathogenic genetic variants of previously benign parasites/pathogens (HPAI, Bourbon)

Transmission Cycle of Lyme Disease

Two-year Life Cycle for Ixodes scapularis

Stafford, 2007

Lyme Disease Distribution in the Unites States of America

National Lyme disease risk map with four categories of risk

Note: This map demonstrates an approximate distribution of predicted Lyme disease risk in the United States. The true relative risk in any given county compared with other counties might differ from that shown here and might change from year to year. Risk categories are defined in the accompanying text. Information on risk distribution within states and counties is best obtained from state and local public health authorities.

Dengue

Transmission Cycle of Dengue

Nature Reviews | Microbiology

Whitehead et al., 2007

Risk Assessment

Animal Health Protection Act

APHIS authority through AHPA Act

Enables Secretary of Agriculture to:

Prevent, detect, control, eradicate diseases and pests

To protect health/welfare, economic interests, environment and commerce

Prohibit or restrict importation, entry, interstate movement

Cooperate with agencies to control animal diseases

APHIS

Animal Care

Biotechnology Regulatory Services

Wildlife Services

Veterinary Services

International Services

Plant Protection and Quarantine

APHIS Role

- 1. Protect American Agriculture
- 2. Give you the information you need
- 3. Help you import your products safely and appropriately
- 4. Assist you in the permit process
- 5. Work with you up-front so the process goes smoothly
- 6. Enforce the conditions of the permit if necessary
- 7. Cooperate with other Agencies

Coordination and Planning

Coordination conducted through ICS

Planning enhances efficiency

Determine authorities

Identify resources

Identify agricultural routes

Develop communications plans

Ensure appropriate supplies

Understand roles and responsibilities

International Trade Implications at APHIS

For exa	Differentiation Exists between Wildlife and Domestic Animals for Purposes of International Trade	
	Premises	Definitions
	Highly Pathogenic Avian Influenza (HPAI)	Article 10.4.1: "Infection with influenza A viruses of high pathogenicity in birds other than poultry, including wild birds, should be notified according to Article 1.1.3. However, a Member Country should not impose bans on the trade in poultry commodities in response to such a notification, or other information on the presence of any influenza A virus in birds other than poultry, including wild birds.
	Virulent Newcastle Disease Virus (vNDV)	Article 10.9.1 "A Member should not impose bans on the trade in poultry commodities in response to information on the presence of any APMV-1 in birds other than poultry, including wild birds."
	Classical Swine Fever (CSF)	Article 15.2.1 "A Member Country should not impose bans on the trade in commodities of domestic and captive wild pigs in response to a notification of infection with CSFV in wild and feral pigs provided that Article 15.2.2 is implemented."

Routine NNDSS Case Notification Process

7 U.S. Code § 8319.Surveillance of zoonotic diseases

The <u>Secretary</u> of Health and Human Services, through the Commissioner of Food and Drugs and the Director of the Centers for Disease Control and Prevention, and the <u>Secretary</u> of Agriculture shall coordinate the surveillance of zoonotic <u>diseases</u>.

Conclusions

Climate change will affect the distribution and incidence of VBD in the U.S.

Impacts will vary from region to region

Current evidence suggests impacts on some diseases may already be occurring

Risk assessments constrained by complex transmission cycles and multiple determinants

The need for interagency coordination is paramount and is already statutorily authorized with models e.g. Coordinated Framework for the Regulation of Biotechnology

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Towards Green Healthcare Reform In the United States

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Abstract

In 2014, the United States health care industry produced an estimated 480 ٠ million metric tons of carbon dioxide (CO_2) ; nearly 8% of the country's total emissions. The importance of sustainability in health care—as a business reliant on fossil fuels for transportation, energy, and operational functioning—is slowly being recognized. These efforts to green health care are incomplete, since they only focus on health care structures. The therapeutic relationship is the essence of health care—not the buildings that contain the practice. As such, this presentation will first postulate reasons for a lack of environmental sustainability in US health care. Second, the presentation will focus on current green health care initiatives in the United States in which patients and physicians participate. Third, the rationale for participation in green initiatives will be explained. Fourth, the presentation will propose that, based on the environmental values of patients and physicians, health care insurance plans and health care insurance companies can be targeted for green health care reform, thereby closing the loop of sustainable health care delivery.

I. Reasons for a lack of environmental sustainability in US health care

- First, there is not national consensus on the importance of sustainability in domestic policy.
- Second, and similarly, the priority of health care in the United States varies widely,
- third, many health care and hospital systems fail to initiate or maintain sustainability initiatives.
- Fourth, the environmental movement has failed to offer health care an effective paradigm for sustainability.
- Fifth, the invocation of biomedical ethics to support sustainable health care is met with resistance under the erroneous belief that health care ought not be accountable for resource use, since unlimited medical treatments are an inviolable right.

II. Current green health care initiatives in the United States

Patients participation

- 1. education
- 2. carbon awareness
- 3. ecotherapy

Physicians participation

- 1. activism
- 2. green health centers
- 3. green teams
- 4. green prescriptions
- 5. education

III. Rationale for participation in green initiatives

Patients

- 1. value of nature
- 2. reduce health issues

Physicians

- 1. health promotion
- 2. discomfort with waste

= consensus patients and physicians around the themes of "health" and "ecology."

IV. Green health care reform

• Health care insurance plans

1. "Green" tier of coverage in addition to Bronze, Silver, Gold and Platinum

• Health care insurance companies

1. accountable for environmentally sound practices

Principles of Green Bioethics: Sustainability in Health Care (Michigan State University Press, 2019) is available at Amazon.com, Barnes and Noble.com, Blackwell's (UK), and MSU Press.

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60

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